



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,435	03/25/2004	Alexander P. Payne	10021.002510 (P0309)	1489
31894	7590	03/10/2006	EXAMINER	
OKAMOTO & BENEDICTO, LLP P.O. BOX 641330 SAN JOSE, CA 95164			THOMAS, BRANDI N	
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/811,435	<b>Applicant(s)</b> PAYNE ET AL.	
	<b>Examiner</b> Brandi N. Thomas	<b>Art Unit</b> 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4/16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Detailed Action</u> .                  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mermelstein et al. (US 2002/0141039 A1).

Regarding claim 4, Mermelstein et al. discloses, in figures 3 and 5a-5c, a movable membrane for light modulation, comprising: a substantially optically active region (52) (section 0058); and a released membrane portion (54) surrounding the optically active region (52) (section 0058), wherein: the substantially optically active portion (52) includes a plurality of gaps configured to expose a lower surface (section 0058 and 0065) but does not specifically disclose wherein the optically active portion is circular in shape. However, it would have been obvious to fabricate the invention to include an optically active portion that is circular in shape, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art (In re Rose, 105 USPQ 237 (CCPA 1955)). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to fabricate the optically active portion to have a circular shape for the purpose of maintaining the shape of the released membrane.

Regarding claim 5, Mermelstein et al. discloses, in figures 3 and 5a-5c, a movable membrane for light modulation, wherein: the substantially optically active region (52) remains substantially flat while deflected (figures 5a-5c and section 0065).

Regarding claim 6, Mermelstein et al. discloses, in figures 3 and 5a-5c, a movable membrane for light modulation, wherein: an area of the lower surface exposed through the plurality of gaps is substantially equal to an upper surface area (section 0065).

Regarding claim 7, Mermelstein et al. discloses, in figures 3 and 5a-5c, a movable membrane for light modulation, wherein: an optical energy of the lower surface exposed through the plurality of gaps is substantially equal to an upper surface optical energy (section 0065 and 0066).

3. Claims 8-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maheshwari (6829077 B1) in view of Hornbeck (4441791).

Regarding claim 8, ~~MAHESHWARI~~, Maheshwari discloses, in figures 1 and 2A, a micro electromechanical system (MEMS) device (13) capable of light modulation, the device comprising: an optically active area (second edge) that is reflective and configured to be illuminated (col.4, lines, 24-27 and 41-47); a non-optically active portion (first edge) between the optically active portion (second edge) and the support structure (post 14 and 16) (col. 3, lines 62-64); and a plurality of gaps in the optically-active portion (second edge) (col. 3, lines 64-66) but does not specifically disclose a membrane and the optically active region having a circular shape. However, it would have been obvious to fabricate the invention to include an optically active portion that is circular in shape, since such a modification would have involved a mere

Art Unit: 2873

change in the shape of a component. A change in shape is generally recognized as being with the level of ordinary skill in the art (*In re Rose*, 105 USPQ 237 (CCPA 1955)). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to fabricate the optically active portion to have a circular shape for the purpose of maintaining the shape of the released membrane. Hornbeck discloses the use of a membrane in a light modulator (col. 2, lines 24-30 and col. 5, lines 39-44). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Maheshwari with the membrane of Hornbeck for the purpose of defining a deformable mirror (col. 2, lines 24-30 and col. 5, lines 39-44).

Regarding claim 9, Maheshwari discloses the claimed invention but does not specifically disclose the membrane having reflective areas under the plurality of gaps. Hornbeck discloses, in figures 1-4, a micro electromechanical system (MEMS) device, further comprising: a substrate (10) below the membrane having reflective areas under the plurality of gaps (col. 5, lines 39-49). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Maheshwari with the membrane of Hornbeck for the purpose of defining a deformable mirror (col. 2, lines 24-30 and col. 5, lines 39-44).

Regarding claim 10, Maheshwari discloses, in figures 1 and 2A, a micro electromechanical system IMEMSI device (13), including an optically active area (second edge) (col. 4, lines 24-27) and a non-optically-active portion (first edge) (col. 4, lines 21-24) but does not specifically disclose wherein the non-optically-active membrane portion (first edge) is larger in area than the optically active portion membrane portion. However, it would have been obvious to fabricate the invention to include wherein the non-optically-active membrane portion (first

Art Unit: 2873

edge) is larger in area than the optically active portion membrane portion, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being with the level of ordinary skill in the art (In re Rose, 105 USPQ 237 (CCPA 1955)). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to fabricate the invention to include wherein the non optically-active membrane portion (first edge) is larger in area than the optically active portion membrane portion for the purpose of having a smaller area in which light is capable of impinging.

Regarding claim 11, Maheshwari discloses, in figures 1 and 2A, a micro electromechanical system (MEMS) device (13), wherein the optically-active membrane portion (first edge) bends less than the non-optically-active membrane portion (col. 4, lines 59-66) but does not specifically disclose a membrane. Hornbeck discloses the use of a membrane in a light modulator (col. 2, lines 24-30 and col. 5, lines 39-44). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Maheshwari with the membrane of Hornbeck for the purpose of defining a deformable mirror (col. 2, lines 24-30 and col. 5, lines 39-44).

Regarding claim 12, Maheshwari discloses, in figures 1 and 2A, a micro electromechanical system (MEMS) device (13), wherein the optically active membrane portion remains substantially flat (figure 2A) (col.4, lines 31-36) but does not specifically disclose a membrane. Hornbeck discloses the use of a membrane in a light modulator (col. 2, lines 24-30 and col. 5, lines 39-44). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Maheshwari with the membrane

Art Unit: 2873

of Hornbeck for the purpose of defining a deformable mirror (col. 2, lines 24-30 and col. 5, lines 39-44).

Regarding claim 13, Maheshwari discloses, in figures 1 and 2-4, a micro electromechanical system (MEMS) device (13), wherein the gaps in the optically-active membrane portion (second edge) are configured so that substantially equal optical energies are reflected from substrate below (col. 4, lines 51-58) but does not specifically disclose a membrane. Hornbeck discloses the use of a membrane in a light modulator (col. 2, lines 24-30 and col. 5, lines 39-44). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Maheshwari with the membrane of Hornbeck for the purpose of defining a deformable mirror (col. 2, lines 24-30 and col. 5, lines 39-44).

Regarding claim 14, Maheshwari discloses, in figures 1 and 2A, a micro electromechanical system (MEMS) device (13), wherein the gaps in the optically-active membrane portion (second edge) and the reflective areas (22) under the gaps are covered with a same reflective material (col. 4, lines 15-21).

Regarding claim 15, Maheshwari discloses, in figures 1 and 2A, a micro electromechanical system (MEMS) device (13), wherein the reflective material (22) comprises aluminum (col. 4, lines 16-19).

Regarding claim 16, Maheshwari discloses the claimed invention but does not specifically disclose wherein the membrane comprises a compliant material from a group of compliant materials including polymeric materials, metals, polycrystalline materials, and amorphous materials. Hornbeck discloses a micro electromechanical system (MEMS) device,

Art Unit: 2873

wherein the membrane comprises a compliant material from a group of compliant materials including polymeric materials, metals, polycrystalline materials, and amorphous materials (col. 2, lines 34-38). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a group of compliant materials including polymeric materials, metals, polycrystalline materials, and amorphous materials for the purpose of their characteristics of withstanding extreme environments.

#### *Response to Arguments*

4. Applicant's arguments with respect to claims 4-16 have been considered but are moot in view of the new ground(s) of rejection.

#### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N. Thomas whose telephone number is 571-272-2341. The examiner can normally be reached on 7- 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2873

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BNT

BNT  
February 28, 2006

  
RICKY MACK  
SUPERVISORY PATENT EXAMINER